Sample Agreement

THIS AGREEMENT is by and between INDIAN RIVER COUNTY, a Political Subdivision of the State of Florida organized and existing under the Laws of the State of Florida, (hereinafter called Owner) and _____ (hereinafter called Contractor). Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 - WORK

Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Fiber Optic Engineering, Design, Material, Supplies and Installation

ARTICLE 2 - THE PROJECT

The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Project Name: Annual Bid for Fiber Optic Engineering, Design, Material, Supplies and Installation
Bid Number: 2023056
Project Address: Various throughout Indian River County

ARTICLE 3 - TERM

The term of the agreement is one year, with four additional one-year extensions available, subject to mutual agreement and determination that extension is in the Owner's best interest. Extensions will be offered 90 days prior to the end of the current contract term.

ARTICLE 4 - CONTRACT PRICE

4.01 Work shall be completed at the prices provided in the Contractor's bid, attached hereto as Exhibit 2. Where demonstrated to the County's satisfaction, unit prices may be adjusted annually by the Consumer Price Index-All Urban Consumers for the South Region ("CPI-U, South Region"), or in rare cases by extreme fluctuations in manufacturers' pricing (e.g. rapid run-up in price of copper). Any change to unit prices must be requested in writing, and with sufficient supporting documentation, no less than 60 days in advance of the proposed effective date, and must be approved by amendment to this agreement. The County will not unreasonably withhold approval of such increases that can be adequately verified.

4.02 Whenever the term "Work Authorization" is used herein, it is intended to mean that formal document that is dated; serially numbered; and executed by the Owner, by which the Owner accepts Contractor's proposal for specific services and Contractor indicates a willingness to perform such specific services for the terms and under the conditions specified in this Agreement. Each Purchase Order must be fully executed by the Owner, and will reference this bid and the Contractor's proposal.

4.03 All services provided by the Contractor for the Owner shall be identified in Work Authorizations and performed in a timely, efficient, cost effective manner. Work Authorization shall include a description of services to

be performed; a statement of fees; a schedule of deliverables; proposed schedule for compensation and whether compensation is lump sum maximum amount not to exceed task based, or any combination of the foregoing; a budget establishing the amount of compensation to be paid with sufficient detail so as to identify all of the various elements of costs; and any other additional instructions or provisions relating to the specific Services authorized pursuant to each Purchase Order that does not conflict with the terms of this Agreement.

4.04 Services related to any individual Work Authorization which would increase, decrease or which are otherwise outside the scope of Services or level of effort contemplated by a Work Authorization shall be Services for which the Contractor must obtain the prior written approval of the Owner as provided by this Agreement. All terms for the performance of such Services must be agreed upon in a written amendment to the Work Authorization, executed by both the Contractor and the Owner.

4.05 A Work Authorization shall not give rise to any contractual rights until it meets the foregoing requirements. Each specific Work Authorization, as approved by the Owner, shall be an addendum to this Agreement. Nothing contained in any Work Authorization shall conflict with the terms of this Agreement, and the terms of this Agreement shall be deemed to be incorporated in each individual Work Authorization as if fully set forth therein.

ARTICLE 5 - PAYMENT PROCEDURES

5.01 Invoices

Contractor shall submit original invoices electronically, with all necessary backup, to the Information Services & Telecommunications (IS&T) Division. The IS&T Division will utilize the duplicate invoice copy to validate the billing invoice and effect the correct payment amount through the Finance Department.

All billing invoices submitted to the County shall contain the following documentation and information:

a. Location (County work center and complete address) where work was performed
b. Owner-issued Purchase Order (PO) number
c. Name of the IS&T Division representative generating the service request
d. Contractor's trouble ticket number or T&M work sheet identification number
e. Description of T&M work activity actually performed or a description of trouble clearance. A List of all material used to complete the work request or trouble AND a copy of receipt(s) from Contractor's supply source depicting actual cost of material provided to complete the work request.
f. Job start date, end date and time
g. Test results completed after installation as specified in Specifications, Section 7.2.5
h. The IS&T Division is required to validate the accuracy of all billing invoices before payment authorization can be made; therefore, billing invoices received which do not contain the required information will result in a delay in payment. Invoices which cannot be validated by the Owner shall not be paid.

5.02 Method of Payment

Owner shall make only one payment for the entire amount of each work order, when the work has been completed. Upon a determination of satisfactory completion, the Owner's Project Manager will authorize payment to be made. All payments for services shall be made to the Contractor by the Owner in accordance with the Local Government Prompt Payment Act, as may be amended from time to time (Section 218.70, Florida Statutes, et seq.).

5.03 Acceptance of Final Payment as Release

The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner from all claims and all liability to the Contractor other than claims in stated amounts as may be specifically excepted by the Contractor for all things done or furnished in connection with the work under this Agreement and for every act and neglect of the Owner and others relating to or arising out of the work. Any payment, however, final or otherwise, shall not release the Contractor or its sureties from any obligations under this Agreement, or the Invitation to Bid.

5.04 Monthly Statements

The Contractor shall electronically provide the IS&T Division Manager with a monthly account statement. Account statements shall contain a detailed listing of all invoices presented to the Owner with an indication of the status (paid or unpaid) of each invoice.

ARTICLE 6 - INDEMNIFICATION

6.01 Contractor shall indemnify and hold harmless the Owner, and its officers and employees, from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the Contractor and persons employed or utilized by the Contractor in the performance of the Work.

ARTICLE 7 - CONTRACTOR'S REPRESENTATIONS

7.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Invitation to Bid documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including applying the specific means, methods, techniques, sequences, and procedures of construction, if any, expressly required by the Contract Documents to be employed by Contractor, and safety precautions and programs incident thereto.

E. Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

F. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

G. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

H. Contractor has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Owner is acceptable to Contractor.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

J. Contractor is registered with and will use the Department of Homeland Security's E-Verify system (www.e-verify.gov) to confirm the employment eligibility of all newly hired employees for the duration of this agreement, as required by Section 448.095, F.S. Contractor is also responsible for obtaining proof of E-Verify registration and utilization for all subcontractors.

ARTICLE 8 - CONTRACT DOCUMENTS

8.01 *Contents*

A. The Contract Documents consist of the following:

(1) This Agreement;
(2) Work Authorizations/Purchase Orders
(3) Certificate(s) of Liability Insurance;
(4) Invitation to Bid 2023056;
(5) Addendum 1;
(6) Contractor's Bid Form;
(7) Qualifications Questionnaire;
(8) Drug Free Workplace Form;
(9) Sworn Statement Under Section 105.08, Indian River County Code, on Disclosure of Relationships;
(10) Certification Regarding Prohibition Against Contracting with Scrutinized Companies;
(11) Certification Regarding Lobbying;
(12) Indian River County Fiber Infrastructure Non-Disclosure Acknowledgement
(13) Written Amendments, executed by both parties, which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto.

ARTICLE 9 - MISCELLANEOUS

9.01 *Terms*

A. Terms used in this Agreement will have the meanings indicated in the Invitation to Bid.

9.02 *Assignment of Contract*

A. No assignment by a party hereto of any rights under or interests in the Agreement will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such

consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

9.03 *Successors and Assigns*

A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

9.04 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

9.05 *Venue*

A. This Agreement shall be governed by the laws of the State of Florida. Venue for any lawsuit brought by either party against the other party or otherwise arising out of this Agreement shall be in Indian River County, Florida, or, in the event of a federal jurisdiction, in the United States District Court for the Southern District of Florida.

9.06 *Public Records Compliance*

A. Indian River County is a public agency subject to Chapter 119, Florida Statutes. The Contractor shall comply with Florida's Public Records Law. Specifically, the Contractor shall:

(1) Keep and maintain public records required by the County to perform the service.

(2) Upon request from the County's Custodian of Public Records, provide the County with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119 or as otherwise provided by law.

(3) Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the contractor does not transfer the records to the County.

(4) Upon completion of the contract, transfer, at no cost, to the County all public records in possession of the Contractor or keep and maintain public records required by the County to perform the service. If the Contractor transfers all public records to the County upon completion of the contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the contractor keeps and maintains public records upon completion of the contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the County, upon request from the

Custodian of Public Records, in a format that is compatible with the information technology systems of the County.

B. **IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:**

(772) 226-1424
publicrecords@ircgov.com
Indian River County Office of the County Attorney
1801 27th Street
Vero Beach, FL 32960

C. Failure of the Contractor to comply with these requirements shall be a material breach of this Agreement.

ARTICLE 10 – FEDERAL CLAUSES

10.01 Owner and Contractor will adhere to the following, as applicable to this work:

A. **Equal Employment Opportunity.** During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment

(5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions as may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

B. **Further Compliance with the Contract Work Hours and Safety Standards Act:**

(1) The contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid.

(2) Records to be maintained under this provision shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the Department of Homeland Security, the Federal Emergency Management Agency, and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

C. **Clean Air Act and Federal Water Pollution Control Act:**

(1) Clean Air Act.

(a) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

(b) The contractor agrees to report each violation to the Owner and understands and agrees that the Owner will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

(c) The contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA.

(2) Federal Water Pollution Control Act

(a) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

(b) The contractor agrees to report each violation to the Owner and understands and agrees that the Owner will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

(c) The contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA.

D. **Suspension and Debarment**

(1) This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such the contractor is required to verify that none of the contractor, its principals (defined at 2 C.F.R. § 180.995), or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

(2) The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

(3) This certification is a material representation of fact relied upon by Owner. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to Owner, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

(4) The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

E. **Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended)**

Contractors who apply or bid for an award of $100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

F. **Procurement of Recycled/Recovered Materials:**

(1) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired—

(i) Competitively within a timeframe providing for compliance with the contract performance schedule;

(ii) Meeting contract performance requirements; or

(iii) At a reasonable price.

(2) Information about this requirement is available at EPA's Comprehensive Procurement Guidelines web site, https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program.

(3) The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

G. **Prohibition on Contracting for Covered Telecommunications Equipment or Services:**

(a) Definitions. As used in this clause, the terms backhaul; covered foreign country; covered telecommunications equipment or services; interconnection arrangements; roaming; substantial or essential component; and telecommunications equipment or services have the meaning as defined in FEMA Policy 405-143-1, Prohibitions

on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services (Interim), as used in this clause—

(b) Prohibitions.

(1) Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after Aug.13, 2020, from obligating or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons.

(2) Unless an exception in paragraph (c) of this clause applies, the contractor and its subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds from the Federal Emergency Management Agency to:

(i) Procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;

(ii) Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;

(iii) Enter into, extend, or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system; or

(iv) Provide, as part of its performance of this contract, subcontract, or other contractual instrument, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.

(c) Exceptions.

(1) This clause does not prohibit contractors from providing—

(i) A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or

(ii) Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(2) By necessary implication and regulation, the prohibitions also do not apply to:

(i) Covered telecommunications equipment or services that:

i. Are not used as a substantial or essential component of any system; and

ii. Are not used as critical technology of any system.

(ii) Other telecommunications equipment or services that are not considered covered telecommunications equipment or services.

(d) Reporting requirement.

(1) In the event the contractor identifies covered telecommunications equipment or services used as a substantial or essential component of any system, or as critical technology as part of any system, during contract performance, or the contractor is notified of such by a subcontractor at any tier or by any other source, the contractor shall report the information in paragraph (d)(2) of this clause to the recipient or subrecipient, unless elsewhere in this contract are established procedures for reporting the information.

(2) The Contractor shall report the following information pursuant to paragraph (d)(1) of this clause:

(i) Within one business day from the date of such identification or notification: The contract number; the order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.

(ii) Within 10 business days of submitting the information in paragraph (d)(2)(i) of this clause: Any further available information about mitigation actions undertaken or recommended. In addition, the contractor shall describe the efforts it undertook to prevent use or submission of covered telecommunications equipment or

services, and any additional efforts that will be incorporated to prevent future use or submission of covered telecommunications equipment or services.
(e) Subcontracts. The Contractor shall insert the substance of this clause, including this paragraph (e), in all subcontracts and other contractual instruments.

H. **Domestic Preference for Procurements**
As appropriate, and to the extent consistent with law, the contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. This includes, but is not limited to iron, aluminum, steel, cement, and other manufactured products.
For purposes of this clause:
Produced in the United States means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
Manufactured products mean items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

I. Access to Records The following access to records requirements apply to this contract:
(1) The contractor agrees to provide Owner, the State of Florida, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.
(2) The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.
(3) The contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.
(4) In compliance with section 1225 of the Disaster Recovery Act of 2018, the Owner and the Contractor acknowledge and agree that no language in this contract is intended to prohibit audits or internal reviews by the FEMA Administrator or the Comptroller General of the United States.

J. **DHS Seal, Logo, and Flags:** The contractor shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA pre-approval. The contractor shall include this provision in any subcontracts.

K. **Compliance with Federal Law, Regulations, and Executive Orders:** This is an acknowledgement that FEMA financial assistance will be used to fund all or a portion of the contract. The contractor will comply will all applicable Federal law, regulations, executive orders, and FEMA policies, procedures, and directives.

L. **No Obligation by Federal Government**: The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, contractor, or any other party pertaining to any matter resulting from the contract.

M. **Program Fraud and False or Fraudulent Statements or Related Acts:** The contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to its actions pertaining to the contract.

N. **Affirmative Steps:** If subcontracts are to be let, the prime contractor is required to take all necessary steps identified in 2 C.F.R. § 200.321(b)(1)-(5) to ensure that small and minority businesses, women's business enterprises, and labor surplus area firms are used when possible.

O. **License and Delivery of Works Subject to Copyright and Data Rights:** The Contractor grants to the Owner a paid-up, royalty-free, nonexclusive, irrevocable, worldwide license in data first produced in the performance of this contract to reproduce, publish, or otherwise use, including prepare derivative works, distribute copies to the public, and perform publicly and display publicly such data. For data required by the contract but not first produced in the performance of this contract, the Contractor will identify such data and grant to the Owner or acquires on its behalf a license of the same scope as for data first produced in the performance of this contract. Data, as used herein, shall include any work subject to copyright under 17 U.S.C. § 102, for example, any written reports or literary works, software and/or source code, music, choreography, pictures or images, graphics, sculptures, videos, motion pictures or other audiovisual works, sound and/or video recordings, and architectural works. Upon or before the completion of this contract, the Contractor will deliver to the Owner data first produced in the performance of this contract and data required by the contract but not first produced in the performance of this contract in formats acceptable by the Owner.

Article 11: TERMINATION OF CONTRACT

A. The occurrence of any of the following shall constitute a default by Contractor and shall provide the Owner with a right to terminate this Contract in accordance with this Article, in addition to pursuing any other remedies which the Owner may have under this Contract or under law:
(1) if in the Owner's opinion Contractor is improperly performing work or violating any provision(s) of the Contract Documents;
(2) if Contractor neglects or refuses to correct defective work or replace defective parts or equipment, as directed by the Engineer pursuant to an inspection;
(3) if in the Owner's opinion Contractor's work is being unnecessarily delayed and will not be finished within the prescribed time;
(4) if Contractor assigns this Contract or any money accruing thereon or approved thereon; or
(5) if Contractor abandons the work, is adjudged bankrupt, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for Contractor or for any of his property.

B. Owner shall, before terminating the Contract for any of the foregoing reasons, notify Contractor in writing of the grounds for termination and provide Contractor with ten (10) calendar days to cure the default to the reasonable satisfaction of the Owner.

C. If the Contractor fails to correct or cure within the time provided in the preceding Sub-Article B, Owner may terminate this Contract by notifying Contractor in writing. Upon receiving such notification, Contractor shall immediately cease all work hereunder and shall forfeit any further right to possess or occupy the site or any materials thereon; provided, however, that the Owner may authorize Contractor to restore any work sites.

D. The Contractor shall be liable for:
(1) any new cost incurred by the Owner in soliciting bids or proposals for and letting a new contract; and
(2) the difference between the cost of completing the new contract and the cost of completing this Contract;
(3) any court costs and attorney's fees associated with any lawsuit undertaken by Owner to enforce its rights herein.

E. TERMINATION FOR CONVENIENCE: Owner may at any time and for any reason terminate Contractor's services and work for Owner's convenience. Upon receipt of notice of such termination Contractor shall,

unless the notice directs otherwise, immediately discontinue the work and immediately cease ordering of any materials, labor, equipment, facilities, or supplies in connection with the performance of this Contract. Upon such termination Contractor shall be entitled to payment only as follows:

(1) the actual cost of the work completed in conformity with this Contract and the specifications; plus,

(2) such other costs actually incurred by Contractor as are permitted by the prime contract and approved by the Owner.

Contractor shall not be entitled to any other claim for compensation or damages against the County in the event of such termination.

F. TERMINATION IN REGARDS TO F.S. 287.135: Contractor certifies that it and those related entities of Contractor as defined by Florida law are not on the Scrutinized Companies that Boycott Israel List, created pursuant to s. 215.4725 of the Florida Statutes, and are not engaged in a boycott of Israel. In addition, if this agreement is for goods or services of one million dollars or more, Contractor certifies that it and those related entities of Contractor as defined by Florida law are not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, created pursuant to Section 215.473 of the Florida Statutes and are not engaged in business operations in Cuba or Syria.

Owner may terminate this Contract if Contractor is found to have submitted a false certification as provided under section 287.135(5), Florida Statutes, been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or been engaged in business operations in Cuba or Syria, as defined by section 287.135, Florida Statutes.

Owner may terminate this Contract if Contractor, including all wholly owned subsidiaries, majority-owned subsidiaries, and parent companies that exist for the purpose of making profit, is found to have been placed on the Scrutinized Companies that Boycott Israel List or is engaged in a boycott of Israel as set forth in section 215.4725, Florida Statutes.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in duplicate. One counterpart each has been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____, 20___ (the date the Agreement is approved by the Indian River County Board of County Commissioners, which is the Effective Date of the Agreement).

OWNER:

INDIAN RIVER COUNTY

By:_____
Joseph H. Earman, Chairman

By:_____
John A. Titkanich, Jr., County Administrator

APPROVED AS TO FORM AND LEGAL SUFFICIENCY:

By: _____
William K. DeBraal, County Attorney

Ryan L. Butler, Clerk of Court and Comptroller

Attest: _____
Deputy Clerk
(SEAL)

Designated Representative:
Dan Russell
Director, Information Technology
1801 27th Street, Vero Beach, FL 32960
772-226-1698
drussell@ircgov.com

CONTRACTOR:

_____

By: _____
(Contractor)

(CORPORATE SEAL)

Attest _____

Address for giving notices:
_____
_____
_____

License No. _____
(Where applicable)

Agent for service of process: _____

Designated Representative:
Name:_____
Title: _____
Address:
_____
_____
Phone: _____
Email: _____

(If Contractor is a corporation or a partnership, attach evidence of authority to sign.)

Exhibit 1 to the Agreement – Specifications

The term "Asset Owner" in this Exhibit refers to the owner of the fiber assets, or other electronic equipment assets that are being serviced under any order resulting from this solicitation. Indian River County is soliciting this bid on its own behalf, but it is anticipated any award will also be utilized by the members of the Indian River Fiber Consortium ("Consortium"), which includes the County, the City of Vero Beach, and the Indian River County School District. No work may be completed on any Owner's assets without prior project-specific coordination with and authorization by that Owner.

This is not an exclusive agreement. Owner may, at its discretion, secure the services of other vendors for the work content represented in this agreement. Owner may also contract with vendors who have been awarded groups in this bid under other contract arrangements and price structures, such as in cases in which simple unit pricing is not the most advantageous method of procurement.

Responsibilities

Owner's Responsibilities

Owner shall:

1. Order services on an as needed basis, by issue of a physical purchase order, or verbal issue of a (five-digit) purchase order number in cases of emergency.
2. Provide access to the work area.
3. Designate a Project Supervisor, which shall have the responsibility to ensure compliance with contract requirements, such as, but not limited to, inspection and acceptance.
4. Inspect the service upon completion of work to ensure that the work is acceptable.
5. Reserve the right to require the removal of any of the Contractor's employees from the project, if in the Owner's judgement, such removal is necessary to protect the Owner's interest.

Contractor's Responsibilities

The Contractor shall:

1. Coordinate all activities with the Owner's Project Supervisor on a daily basis.
2. Not substitute from the agreed upon installation plan or repair method, as well as the equipment to be used without prior written approval in the form of a Purchase Order Change Order.
3. Ensure that all equipment operators (including subcontractors) are competent in the use of assigned equipment.
4. Ensure that all personnel (including subcontractors) are in uniform at all time, and have on their body all of the required identification required within the contract.
5. Maintain a clean and professional work environment at all times.
6. Use full-time permanent employees for all of the following:
    a. PE services
    b. CADD services
    c. GIS services
    d. Clerical services
    e. ROW strand mapping, design and permitting
    f. Fiber optic cable installation
    g. Fiber optic cable terminating, splicing and testing

Utilization of Subcontractors

The use of subcontractors on the contract shall be strictly restricted to the following:

1. Conduit installation – hand trenched, machine trenched or bridge mounted
2. Directional boring
3. Direct bury by plowing
4. Pull box installation
5. Pull box concrete installation
6. Innerduct installation
7. Pole riser installation
8. Detectable marking tape installation
9. Concrete pole installation
10. Communication or device cabinet installation
11. Route marker or ROW marker post installation
12. NexusWorx Data Entry
13. BICSI/RCCD services

Protection of Information

All information provided to the Contractor and its assignees in reference to work proposed or performed for the Owner, such as Organizational Data Network, ISP or OSP fiber optic infrastructure (topology, routes, segments, layout, or fiber connectivity points), Electronic Data, Printed Materials, GIS Shape Files, or Maps provided to the Contractor or any member of the Contractor's organization, is of a confidential and security sensitive nature, per U.S. Homeland Security requirements. **No information may be disclosed, disseminated, or otherwise allowed to be accessed by unauthorized personnel, without the specific written authorization of County and/or Owner**. Acceptance of a formal Non-Disclosure Agreement (NDA) is a prerequisite to commencement of work.

Permitting and Licensure Requirements

In addition to permits through Indian River County's Building Division, the Contractor may be required to obtain permits for work under this bid from the Florida Department of Transportation, and/or Florida East Coast Railroad. The price to be paid for permit(s) shall be based on the Contractor's actual permit cost. Contractor shall supply original permit(s) cost documentation to the Indian River County Information Technology Department requesting the service. Any Federal or State taxes paid by the Contractor to its suppliers for a permit(s) are not reimbursable by the County to the Contractor.

All work under this agreement will be payable at the per unit prices provided in Exhibit 2.

The groups of work are:

Group		Section(s)
1	Technical Labor	
2	OSP Construction Conduit, Pull Boxes and Junction Boxes	FDOT Standard Specifications for Road and Bridge Construction Section 630 FDOT Standard Specifications for Road and Bridge Construction Section 635
3	Fiber Optic Cable, Preterm Drops, Splicing Terminations.	FDOT Standard Specifications for Road and Bridge Construction Section 633

4	Multi-Pair Cables	FDOT Standard Specifications for Road and Bridge Construction Section 633
5	NexusWorx Application – Fiber Documentation	Technical Labor (County Specification 852)

Warranty

The Contractor shall fully warrant all labor furnished hereunder against defect in workmanship for a period of ninety (90) days from date of delivery and acceptance by Owner. Equipment furnished hereunder must be warrantied against defect in materials for a period of one (1) year from date of delivery and acceptance by Owner. Should any defect in materials or workmanship, excepting ordinary wear and tear, appear during the above stated warranty period, Contractor shall repair or replace same at no cost to Owner, immediately upon written notice from the Purchasing Division.

Worksite Safety / Security

Contractor shall at all times guard against damage or loss to the property of the Owner, Contractor's own property, and/or that of other contractors, and shall be held responsible for replacing or repairing any such loss or damage. When applicable, Contractor shall provide fences, signs, barricades, flashing lights, etc. necessary to protect and secure the worksite(s) and insure that all County, State of Florida, OSHA, and other applicable safety regulations are met. Additionally, Contractor shall provide for the prompt removal of all debris from Owner's property. Owner may withhold payment or make such deductions as deemed necessary to ensure reimbursement or replacement for loss or damage to property through negligence of the Contractor or its agents.

Specifications

1.0 Introduction

1.1 Owner Acceptance

1.1.1 Payment shall be rendered **ONLY** upon Owner's acceptance of said service. Acceptance is defined as a receipt signed by the designated Owner representative(s), as acknowledgement of services rendered.

1.2 Scope

1.2.1 This exhibit delineates the requirements for the material, labor and support services to be provided.

1.2.2 The Contractor shall, on an as needed basis, be responsible for the integration, supply and/or installation, connection, and maintenance/repair of the Owner's enterprise network systems, OSP (outside plant), various types of fiber optic cable, equipment and supplies, and general network-type cabling systems. The Contractor may be required to also provide the same or like services, on an as needed basis, in support of new Owner-owned buildings and facilities.

1.2.3 There are approximately 47 plus Owner facilities where these services may be required. Other sites may be added during the term of the contract, dependent on Owner needs.

1.2.4 The reference to "47 plus" Owner facilities is solely provided for informational purposes. The Contractor will be required to provide services as specified, on a time and material basis, anywhere geographically within Indian River County.

1.2.5 The overall scope includes, but is not limited to, providing and/or installing (including: inter-building, intra-building, fiber optic cabling) fiber optic equipment, and maintenance/repair

services. When practical and possible, the Contractor shall utilize existing cable runs and conduits, unless directed otherwise by IS&T.

1.2.6 Indian River County IS&T Division ("IS&T") will periodically notify the Contractor of required work to be performed.

2.0 Specifications – General

2.1 Qualifications of Bidders

2.1.1 Contractor must maintain the qualifications listed in the Invitation to bid, under Permitting and Licensure Requirements.

2.2 Pricing

2.2.1 IS&T reserves the right to utilize this agreement for the purpose of obtaining material only, obtaining labor only, or obtaining a combination of material and labor at the unit prices offered in Exhibit 2.

2.3 Acceptance

2.3.1 Any discrepancies in equipment, defects in cabling, operational difficulties or other problems encountered during final testing, and post operation evaluation shall be furnished to the Contractor in writing, per project phase.

2.3.2 Resolution of these items to the satisfaction of the Owner, is required prior to system acceptance. IS&T staff shall verify each of the major components, including, but not limited to, performing random testing of the fiber optic cable.

2.3.3 The date of "acceptance" is defined as the date all required cabling, material, and associated hardware have been installed, tested, operationally activated (when requested), and the required documentation has been presented to the Owner, and all identified discrepancies have been satisfactorily completed on a per-project basis.

3.0 Project Specifications – Non-Technical

3.1 Material and Workmanship

3.1.1 The Contractor shall schedule and coordinate all installation, rearrangement, removal, or repair activity of any/all equipment, through IS&T.

3.1.2 All work shall be performed in a professional manner that is compatible with the Owner's normal business.

3.1.3 The Contractor shall comply with all applicable national, Federal, State, and local rules, regulations, codes, and standards for safety, building, electrical, fire, communications low voltage wiring, and installation work. The Contractor also understands and agrees that all equipment and/or services provided to the Owner, shall comply with specifications set forth in the applicable sections of the Federal Communications Commission Rules and Regulations. In addition, work performed shall be in accordance with industry accepted practices and standards, such as those set forth in EIA/TIA, BISCI. Additionally, all cable, wire, and associated material and equipment provided and installed by the successful bidder, is to have been tested by an approved testing facility and listed for the intended use. Additional information relating to codes, etc., is contained in the following Section 3.1.4.

3.1.4 Installations/Products are to be in accordance with the following codes and standards. Where there is a conflict between the bid document and the applicable code, the most stringent shall govern:

a) American National Standards Institute (ANSI). TIA/EIA – Telecommunications Industry Association/Electronics Industries Association

b) ANSI/TIA/EIA-569-A – Commercial Building Standard for Telecommunications Pathways and Spaces, latest editions

c) ANSI/TIA/EIA-606 – The Administration Standard for Telecommunications Infrastructure of Commercial Building, latest edition

d) ANSI/TIA/EIA-607 – Commercial Building Grounding and Bonding Requirements for Telecommunications, latest editions

e) ANSI/TIA/EIA TSB 72 – Centralized Optical Fiber Cabling Guidelines

f) ANSI/TIA/EIA TSB 75 – Additional Horizontal Cabling Practice for Open Offices

g) ANSI/NFPA 70 Article 318 – Cable Trays

h) American Society for Testing and Material (ASTM)

i) Building Industry Consulting Service International (BISCI)

1. "Telecommunications Distribution Methods Manual"
2. "Telecommunications Installation Manual"
3. "Customer-Owned Outside Plant Design Manual"

j) Underwriters Laboratories (UL)

k) Federal Communications Commission (FCC)

l) Americans with Disabilities Act Requirements (ADA)

m) Occupational Safety and Health Administration Regulations (OSHA)

n) National Fire Protection Association (NFPA)

o) Institute of Electrical and Electronic Engineers (IEEE) Applications standards including, but not limited to, LAN Standard for Ethernet IEEE 802.3

p) National Electrical Manufacturers Association (NEMA)

q) National Electrical Code (NEC)

r) National Electrical Safety Code (NESC)

s) ISO/IEC – International Standard Organization and International Electro technical Commission

3.1.5 All cable, equipment, material, components provided by the Contractor, shall be guaranteed to be new. The Owner reserves the right to supply any/all cable, equipment, material or components out of existing stock.

3.1.6 No cable, equipment, material, components shall be borrowed, substituted, or removed without the express knowledge and consent of IS&T.

3.1.7 See Worksite Safety/Security listed under Technical Specifications – Contractor's Responsibilities

3.1.8 The Contractor shall insure that all personnel assigned to projects have the expertise to perform the services, and have the ability to operate any and all tools and equipment utilized in conjunction with this service, and all personnel on a jobsite have appropriate identification clearly identifying the individuals and the firm they represent available upon request. NOTE: All Contractor employees and all subcontractors employed by the Contractor, shall be required to comply with the Owner's ordinance/policies regarding access to Owner facilities and as such, shall be required to comply with those requirements prior to having access to Owner facilities.

3.1.9 All inside/outside plant installation personnel for inside plant cabling, shall be required to wear uniforms on-site. The company's name shall be predominately displayed. Owner vendor badges shall be worn at all times.

3.1.10 The Contractor is solely responsible for obtaining all permits for all work requests. The Owner shall reimburse the Contractor for the actual cost of the permits. For projects associated with new facilities under construction, the Contractor is required to obtain "stand alone" permits. Sub-permits, under the General Contractor's permits will not be allowed unless specifically approved by the County's Public Works Department in writing. Additionally, the Contractor is solely responsible for any/all costs associated to repair any

items or Owner facility, structure, and/or property which become damaged by the Contractor's installation activity.

Any and all equipment, material, components, cable, etc., provided, installed and operationally activated by the Contractor that is deemed unacceptable by the Owner or does not comply with the specifications herein and rules, regulations, codes, ordinances, or standards as indicated in other sections of this document, shall be replaced with appropriate and compliant products by the Contractor, prior to system acceptance, at no cost whatsoever to the Owner.

3.1.12 All installed backbone fiber cabling shall be end to end tested. Fiber links shall meet the EIA/TIA requirements for connector mated pair reflection loss and splice loss as applicable.

3.1.13 Consumables – Items used for the installation of fiber infrastructure that are expended to complete an installation process are the sole responsibility of the Contractor. Examples of these items are: jet line, electrical tape, label tape, solvents, cleaners, cable lube, polishing paper, etc.

3.2 Manuals and Documentation

3.2.1 It shall be the responsibility of the Contractor to provide the as-built documentation. As-built information should be understood to be part of the work units authorized by Owner. Because as-builts are part of the scope of work for each project, final payment will not be made to the Contractor until the drawings are received and approved by the Owner.

The requirements contained below address some of the data collection processes and methodologies for the outside plant (OSP) as-built documentation.

a) All OSP infrastructures shall be documented utilizing GPS instruments as construction occurs.

b) Provide positioning data for trench deployment. Documentation shall include conduit support infrastructure description, when installation is different than the standard 2" conduit or when more than a single conduit is laced underground, as well as placement. GPS coordinates shall be taken at 150 foot intervals and/or at any running line changes, infrastructure changes (manhole, hand holes, pull boxes, cabinets, and terminations) or other points, as necessary.

c) Provide positioning data for directional bores. Documentation shall include GPS coordinates for each rod length with its corresponding depth. Other points shall be documented as necessary.

d) Provide positioning data of aerial infrastructure by taking GPS coordinates of each pole. Documentation shall include attachment details such as pole type, pole class, riser conduit, height of attachment (HOA), etc., as well as any aerial slacks and aerial splices between poles.

e) Provide positioning data of service loops with slack length, as well as the sequential cable length markings at each splice vault, pull box, terminations or other points.

f) All GPS datasets ported to GIS features classes shall be projected in the NAD 1983 HARN State Plan Florida East FIPZONE 0901 coordinate system, with the unit of measure being U.S. Foot.

g) All GPS points shall have sub foot (< 12 inch) accuracy for horizontal (X, Y) and vertical (Z) axis, unless otherwise specified.

h) Submit as-built data as ESRI file geodatabase. Line and point attributes shall be appropriately formatted and accurately recorded.

4.0 Service Requirements

4.1 Customer Service

4.1.1 Owner requires that the Contractor provide qualified installation, maintenance, repair, and support services, from a service center which shall permit adherence to the service response time frame requirements identified in paragraph 4.2.4.

4.1.2 The Contractor shall assign an Account Manager responsible for coordinating orders for installations, rearrangements, removals, repairs and for resolving billing discrepancies.

4.1.3 The Contractor shall provide an escalation list of names, addresses, and telephone numbers to the IS&T representative prior to Owner's execution of the agreement.

4.1.4 The Contractor shall have a Return Material Authorization (RMA) Program to include, at a minimum, the following:

a) Tracking number
b) Item description
c) Date initiated
d) Reason for return
e) Disposition of returned material
f) Expected resolution date

4.1.5 The Contractor shall have a Business as Usual (BAU) Program to include, at a minimum, the following:

a) Project tracking number with date
b) Brief description
c) Date initiated
d) Anticipated installation start/delivery
e) Anticipated construction completion
f) Responsibility/Ownership for completion (e.g. material delivery, additional information, engineering)
g) Daily updates of standard work request additions/completions and weekly status updates of ongoing projects type work requests.

4.1.6 Due to the importance of the Enterprise Network and the Voice Network, in the operation of the Owner's business, the Contractor is required to provide business recovery services to the County in the event of natural and/or other disasters.

4.2 INSTALLATIONS / REARRANGEMENTS / REPAIRS

4.2.1 All repairs shall be made using Original Equipment Manufacturer (OEM) components. Substitutes, unless designated as a replacement by the manufacturer of the equipment, are not acceptable.

4.2.2 The Contractor shall provide routine and emergency service as required and in accordance with manufacturer and warranty standards. Such action shall be continuous until the problem, or problems, are 100% corrected. There shall be no charge for any work that is covered under the warranty period. The Contractor shall be responsible for all warranty work even after the contract expires, if work/materials are still under warranty.

4.2.3 Should any condition exist which precludes or inhibits the Contractor's ability to satisfy the required response times, the Contractor shall inform IS&T in writing within twenty-four (24) hours.

4.2.4 The Contractor shall initiate repair, and time and material service, after the Owner requests service as follows:

Emergency Trouble Service -- Within three (3) hours of reported trouble and Owner's provision of an emergency PO *number* (written PO will be issued later), during normal business hours; Within six (6) hours on evenings, weekends, and holidays.

Time & Material Service -- Within five (5) workdays of requested work

4.2.5 Emergency Trouble Service: An Emergency Trouble Service is defined as the failure of the network backbone and/or passive/active network component which renders an entire area incapable of performing any of its functions (e.g., a zone, floor, or communications between sites).

a) In the event of an Emergency Trouble Service situation, a trained and qualified technician shall be on-site within three (3) hours of request and notice of emergency PO number. Once a return to service plan is agreed upon, the items needed for the repair as described in Section 4.2.5.b. shall be on-site within two (2) hours.

b) The Contractor shall have fusion splicer, OTDR, 5,000 feet of 96 and 48 strand single-mode fiber, and 2,000 feet of 24 strand, multi-mode fiber cable in inventory for deployment to emergency repair.

4.2.6 Time and Material Service (BAU): Response to BAU requests shall be within five (5) workdays of the requested service.

4.2.7 Should any condition exist that would preclude or inhibit the Contractor's ability to satisfy the maintenance or order work activity within the above specified time frames, the Contractor shall notify IS&T immediately. Additionally, a description of the limiting or exempting condition(s) shall be provided to IS&T with a revised completion date of the required work activity. Furthermore, if such constraining conditions are temporary in nature, the Contractor shall indicate when and/or under what conditions he would again become fully compliant with required response times.

4.2.8 The County's normal working hours shall be defined as Monday through Friday, 8:00 a.m. to 5:00 p.m., excluding County holidays.

5.0 Commencement of Work Notification

5.1 IS&T shall call the Contractor's service center, to report troubles and request all repair and maintenance service. IS&T shall provide the location and all pertinent information related to the trouble report, including the IS&T, (internal) trouble identification number.

5.2 IS&T shall contact the Contractor's service center via fax/e-mail, to request T&M service activity. The fax/e-mail transmittal shall contain all information necessary for scheduling and responding to the request, including location where work is to be performed, IS&T (internal) work request number, requesting IS&T contact person's name and telephone number, on-site (work location) contact name & telephone number, description of work activity to be performed, and/or listing of material to be procured and/or installed.

5.3 The Contractor shall provide to IS&T, a detailed status report on all open projects on a weekly basis. The report shall be delivered via email to the project contact for IS&T.

5.4 The Contractor shall meet (and/or discuss project activity/requirements) with IS&T representative prior to the commencement of any project. Furthermore, the Contractor's project manager shall keep IS&T representative advised of work progress from commencement through completion.

5.5 Upon request, the Contractor shall provide a complete itemized estimate, including scope of work, parts, professional services, etc., per project. These per project, estimates shall be approved in writing, by IS&T authorized personnel, prior to commencement of any project. Additionally, there may be instances where IS&T will request a "not-to-exceed" cost for material and labor on a specific project. The Contractor shall be required to provide the "not-to-exceed" cost then, if directed to by IS&T, to complete the specific project for no more than the "not-to-exceed" dollar amount submitted prior to work commencement.

5.6 For installed products, "Operational Date" is the date all station lines, network backbones, and campus network (when applicable) are fully operational and ready for use.

6.0 INVOICING AND BILLING REQUIREMENTS

6.1 Contractor shall submit original invoices electronically, with all necessary backup, to IS&T Division. IS&T will utilize the duplicate invoice copy to validate the billing invoice and effect the correct payment amount through the Comptroller Division.

6.2 All billing invoices submitted to the Owner shall contain the following documentation and information:

a. Location (Owner's work center and complete address) where work was performed
b. Owner-issued Purchase Order (PO) number
c. Name of the IS&T Division representative generating the service request
d. Contractor's trouble ticket number or T&M work sheet identification number
e. Description of T&M work activity actually performed or a description of trouble clearance. A List of all material used to complete the work request or trouble AND a copy of receipt(s) from Contractor's supply source depicting actual cost of material provided to complete the work request.
f. Job start date, end date and time
g. Test results completed after installation as specified in Specifications, Section 7.2.5
h. The IS&T Division is required to validate the accuracy of all billing invoices before payment authorization can be made; therefore, billing invoices received which do not contain the required information will result in a delay in payment. Invoices which cannot be validated by the Owner shall not be paid.

7.0 PROJECT SPECIFICATION - TECHNICAL

7.1 This "overall" project, with its individual work requests, shall consist of, but is not limited to, the procurement, delivery, installation and testing, of fiber optic cables, fiber optic cable terminations and terminating equipment and hardware, etc.

7.2 TESTING REQUIREMENTS

7.2.1 The Contractor shall be required to perform tests on all fiber installed, to ensure operational and technical conformity. Dispersion, splice loss, and optical time domain tests shall be performed on all fiber optic cable installed.

7.2.2 Dispersion, splice loss, and optical time domain tests, shall be performed on all fiber optic cable installed.

7.2.3 Each reel of fiber optic cable provided by the Contractor shall be accompanied by the manufacturer's test data showing the conformance to the requirements described herein. The manufacturer's test data shall identify each fiber in each cable and list its factory tested attenuation in decibels per kilometer. This attenuation shall meet as a minimum, the attenuation requirements set forth in Table – Fiber Optic Cable Specifications (Section 7.5.2) included in this document.

Ensure that each finished and installed fiber optic cable segment shall be traceable to the test date on file for each step in its manufacturing process. The Contractor shall provide the County five (5) calendar days advance notice of the date the cable will be ready for final testing so that County staff may be present at the tests if staff elects.

7.2.4 The Contractor shall test the fiber optic cable at the site storage area prior to installation. Test each optical fiber in the cable from one end and one wavelength with an OTDR compatible with wavelength and fiber type. Check for continuity, kinks, anomalies, and appropriate attenuation. Record each measurement with color, location and type of fiber measured. If the tested loss per kilometer exceeds the loss from the manufacturers test data, the County will reject the cable. An electronic and hard copy shall be provided to IS&T prior to the fiber optic cable being installed.

7.2.5 After installation (splicing and termination) is complete, and if specified, the Contractor shall test the optical fiber in the cable again for the loss characteristics. Perform a uni-directional test on all terminated fibers using the Optical Time Domain Reflectometer (OTDR). Single mode fiber that is a distance of five (5) miles or less shall be shot at a 1310nm wavelength. Single mode fiber that is greater than five (5) miles shall be shot at a 1550nm wavelength. Multi-mode fiber shall be tested at an 850nm wave length. Results of these tests shall be provided to IS&T in both a hard copy and electronic format for

acceptance. Any failure that shows up on the Contractor's OTDR results may result in total replacement of the fiber optic cable. In addition, IS&T may also perform testing with an OTDR for testing result comparison. If any discrepancies are found, resolution of these items to the satisfaction of the County is required prior to system acceptance.

The Contractor shall notify the Owner in writing, five (5) calendar days in advance of the testing of the cable, so that the Owner staff may be present for the tests. Test result printouts shall include, but not limited to, the following:

a) Distance of trace
b) Total loss
c) Splice loss
d) Cable ID
e) Fiber ID
f) Beginning testing location
g) Fiber testing location
h) Operator/technician name or initials
i) Date and time test was performed
j) Test wavelength
k) Test pulse width
l) Re-factory index

The method of connectivity between the OTDR and the tested fiber shall be factory assembled patch cords, pulse suppression, or launch cables equal to length of 150% of the dead zone as published by the OTDR manufacturer. The launch cable shall have the appropriate connectors to allow for connection to the terminated fiber port, without the use of additional couplers.

The Contractor shall prepare and submit a test procedure for the pre-installation and post installation tests to the Owner for approval.

7.3 FIRESTOPPING

7.3.1 The Contractor shall be required to firestop all penetrations of floors and walls, including cable "riser" openings. All firestopping and sleeves provided shall comply with all local, state, and national codes, as may be amended.

7.4 OSP CONSTRUCTION CONDUIT – UNDERGROUND

7.4.1 General Requirements

a) Consider the locations of conduit as shown on the plans as approximate. Construct conduit runs as straight as possible, and obtain the Engineer's/Owner's approval of all major deviations in conduit locations from those shown on the plans.

b) Do not place more than the equivalent of four quarter bends or 360 degree of bends, including the termination bends, between the two points of termination in the conduit, without a pullbox. Obtain the Engineer's/Owner's approval to use corrugated flexible conduits for short runs 6' or less.

c) Use only intermediate metal conduit, rigid galvanized conduit, rigid aluminum conduit or PVC coated intermediate metal conduit for above-ground or underground electrical power service installations.

d) Use either schedule 80 PVC or fiberglass reinforced epoxy conduit for installations on bridge decks. Use either schedule 40 PVC or fiberglass reinforced epoxy, conduit for underground and under pavement installations, except for electrical power service.

e) When the installation of a conduit requires jacking under paved surfaces, railroads, etc., use an intermediate metal conduit as the sleeve for the underground conduit. Install the underground conduit as shown in the Design Standards, Index No. 17721.

f) When a conduit installation changes from underground to above-ground, make the change a minimum of 6” below finished grade.

g) Install an expansion fitting when conduit crosses an expansion joint of a structure.

h) Use couplings and expansion joints made of the same material as the conduit.

i) Ensure that all joints are made as specified by the manufacturer and are waterproof.

j) For installations not specifically shown, install the conduit in accordance with National Electrical Code (NEC) and/or National Electrical Safety Code (NESC) requirements.

k) When earth backfill and tamping is required, place backfill material in layers approximately 12” thick, and tamp each layer to a density equal to or greater than the adjacent soil.

l) When trenching instead of boring, saw cut and repair all pavement and sidewalks encountered. When backfilling trenches in existing pavement, use a commercially available sand-cement (approximately 10:1 mix ratio).

m) Provide a standard clearance between underground control cable and electrical service cable or another parallel underground electrical service cable that meets National Electrical Safety Code requirements.

n) Install conduit for electrical and low-voltage systems as shown on the plans or referenced to FDOT Design Standards, Index No. 17721. Consider the locations of conduit as shown on the plans as approximate. Construct conduit runs as straight as possible, and obtain the Engineer's/Owner’s approval of all major deviations in conduit locations from those shown on the plans.

o) Provide an outer duct and innerduct that is suitable for underground use in an ambient temperature range of -32° to 130° F, without degradation of material properties.

p) Provide outer duct and innerduct that is resistant to benzene, calcium chloride, ethyl alcohol, fuel oil, gasoline, lubricating oil, potassium chloride, sodium chloride, sodium nitrate, and transformer oil, and is protected against degradation due to oxidation and general corrosion.

q) Provide outer duct and innerduct with an outer diameter to a minimum wall thickness ratio that complies with ASTM – D3035, Standard Dimension Ratio (SDR) 13.5.

r) Provide outer duct and innerduct that meets or exceeds the following:

1. ASTM – D1238: Tensile Strength – 3000 PSI minimum Elongation – 400% minimum
2. ASTM – D1238: Melt Index – 0.4 maximum
3. ASTM – D1505: Density – 0.941 – 0.9 55 g/cc
4. ASTM – D1693: Condition B – 20% failure, maximum
5. ASTM – D2444: Impact – NEMA Standards Publication TC 7
6. ASTM – D3350: Cell Classification – 334420 or 34420

s) Provide outer duct and innerduct with the coefficient of fiction of 0.09 or less.

t) Provide 0.5 inch, pre-lubricated, woven polyester tape with a minimum rated tensile strength of 2,500 lbs.

7.4.2 HDPE Outer Duct

Provide a factory lubricated low friction, coilable, high-density conduit constructed over high-density polyethylene (HDPE). Provide outer duct conduit with a smooth outer wall, and inner wall, and ensure the conduit is capable of being coiled on reels and continuous lengths, transported, stored outdoors and subsequently uncoiled for installation without affecting its properties or performance. Include multi-duct conduit organizers at all points where the multi-duct conduit enters and exits into a junction, pull box, splice vault, or similar structure. Provide conduit spacers that are appropriately sized relative to the ducts.

7.4.3 HDPE Innerduct

Provide a factory lubricated, industry sized 1.5” or 2” inside diameter as listed in the plans, low friction, coilable, conduit constructed of virgin HDPE innerduct. Said innerduct shall conform to ASTM D – 2239 and meet the following minimum requirements: Smooth wall SDR – 11, nominal outer diameter of 1.592 inches, minimum inner diameter 1.360 inches and a minimum wall thickness of 0.106 inches. Provide conduit with a smooth outer wall and ridged inner wall and ensure the conduit is capable of being coiled on reels in continuous lengths, transported, stored outdoors subsequently uncoiled for installation without affecting its properties or performance. Innerduct shall be furnished in the following factory extruded colors: orange, white, black and yellow as specified. Red shall be reserved for electric.

Provide mechanical duct plugs that provide a watertight barrier when installed in an unused conduit or outer duct conduit. Provide duct plugs sized in accordance with the conduit furnished. Provide duct plugs that are removable. All conduit shall come with factory installed duct plugs to keep out dust, dirt, and water.

Provide mechanical sealing devices that provide a watertight barrier between the conduit and communications cable. Provide mechanical sealing devices sized in accordance with conduit furnished and with appropriately sized holes for the communications cable. Provide mechanical sealing devices that are removable.

7.4.4 Secondary Underground Conduit

Furnish and install HDPE or PVC conduit sized per plans for additional pipe in common trench. Install the proper size and quantity of conduits to be used in accordance with the minimum conduit size and quantity requirements of the NEC and as approved by the Owner.

7.4.5 Above Ground Conduit

Furnish and install conduit for above ground use (a riser assembly on a utility service pole for the purpose of bringing power from above ground to underground conduit/duct, or bridge mounted or other above ground structure) consisting of galvanized rigid steel (GRS), aluminum, or Schedule 80 PVC conduit in accordance with ASTM D 1785, as approved by the Owner.

Furnish and install Schedule 80 PVC conduit, aluminum or Rigid Metal Conduit (RMC) for bridge crossings, attached to the bridge structures, under the parapet, wherever feasible and applicable. All rigid steel conduit material utilized shall be compliant with UL-6, ANSI C–80.1 and to Article 346 of the NEC. All aluminum conduits shall be aluminum 6063 aluminum alloy, T – 1 Temper, ANCI C80.5, and NEC 250.118 (2). All required connectors, adapters, fittings, conduit straps or "U" guard clamps and incidentals required and necessary for the above ground installations shall be galvanized and provided to construct a complete conduit/duct system.

No reducing couplings or reduction in the inside diameter of conduit shall be permitted. No intermediate

metallic conduit (IMC) or thin – wall type electrical conduit shall be permitted for outdoor use.

Furnish and install galvanized metal conduit grounding bushing, or aluminum metal conduit grounding bushing on the terminating ends of all GRS/aluminum conduit runs. The bushings shall have an insert made of plastic and or other suitable material to protect

wiring installed in the conduit. The bushing shall have a compression–type grounding lug for bonding the conduit to the ground rod and pull box. Do not field drill ceilings bushings.

7.4.6 Conduit Placement – General

Place conduit (location and depth) as required by the FDOT Utility Accommodation Manual, the plans, or as specified by the Owner. If the required steps cannot be accomplished due to soil conditions, obstructions, etc., additional mechanical protection may be required at the discretion and approval of the Owner.

For underground conduit/duct requiring additional mechanical protection (e.g., boring under railroads, shallow boring depth, proximity to foreign utilities, etc.), furnish and install black steel pipe (BSP) as an outer sleeve/pacing, or other materials as required by the permitting agency and/or approved by the Owner.

After the installation of the innerducts and upon completion of the tamping and backfill process, perform a mandrel test on each individual duct to ensure that no duct has been damaged. Provide a nonmetallic mandrel having a diameter of approximately 1”, for use in 1.25” innerduct. If damage has occurred, replace the entire length of the duct.

Test HDPE conduit for continuity and proper installation using a pressurization process; plug each innerduct and pressurize it to achieve a minimum pressure of 100 PSI for a minimum of 2 minutes.

No roadway pavement cuts will be allowed unless approved by the Owner. Conduit entrances into base–mounted field cabinets through the sides, back or top of the cabinet, are not permitted. All conduit attachments to rigid structures shall require the shop drawing/plan detail showing the attachment method for review.

Conduits terminating base mounted cabinet foundations shall extend a minimum of 2” above the foundation. All bends shall be at a 90° sweep, suitable for fiber optic cable, free from kinks, and of such easy curvature to permit the drawling in of cables without damage to insulation.

All new base mounted field cabinet foundations, shall have installed at least two (2) spare, empty 2” conduits, terminating a pull box.

Any metal conduit utilized shall be grounded and bonded in accordance with the NEC. All installation and construction work on all facilities shall be in compliance with the NESC.

7.4.7 Conduit Placement – Multi-duct Installation in Outer Duct

Simultaneously, install the individual colored innerducts in the outer duct. Install the multi–duct conduits using an approved cable pulling lubricant.

Use a dynamometer (clutch device) so as not to exceed the maximum allowable pulling tension. Do not use a motorized vehicle to generate pulling forces.

Keep tension on the ducts and the pulling line at the start of each pull. Do not release the tension if the pulling operation is halted. Restart the pulling operation by gradually increasing the tension until the multi-ducts are in motion. Once the multi-duct system is installed in the outer duct, install the duct organizers at the point where the multi-duct system enters or exits the junction box, pull box, splice vault, or other similar structure, or a cabinet.

Extend the ends of the multi-duct conduit such that upon completion of the installation, the ducts will extend a minimum of 2” above concrete services and 4” above crushed stone bases.

7.4.8 Conduit Placement – Splicing of the Conduit

Splice or join sections of conduit(s) using the manufacturer’s recommended splice kits. Upon approval, a pull box may be installed at locations where splicing the coupling of the conduit is necessary due to problems encountered with the installation. Use of mechanical couplings may be approved by the Owner on a project basis depending upon project requirements.

7.4.9 Conduit Placement – Duct Plugs and Mechanical Ceiling Devices

Following the installation of conduit where the communications cable is not immediately installed, use a duct plug to seal the ends of the conduit. Secure the pull line to the duct plug in such a manner that it will not interfere with installation of the duct plug and provide a watertight seal.

7.4.10 List of Items for OSP Conduit – Underground

The items and services listed below are not an all-inclusive list. Furnish and install the following items as required:

Conduit – 2” placed at 24”, machine trenched, per foot.

Conduit – 2“ placed at 36”, machine trenched, per foot.

Conduit – 2” placed at 24”, hand trenched, per foot.

Conduit – 2” placed 3”, hand trenched, per foot.

Conduit – 2” extra pipe, per foot.

Placement – 1.25”, innerduct, corrugated, colored, per foot.

Placement – 4W 1.25”, HDPE colored, per foot.

MaxCell Innerduct – placement – 3 cell for 2” and larger conduits.
Include preinstalled color-coded pull tapes for identification, pre-lubricated.

Placement – cable direct bury, plow, 30” placement, per foot.

Placement – 2” HDPE, directional bore, per foot.

Placement – 2” HDPE, directional bore, special conditions, per foot.

Placement – 8” HDPE, directional or, underwater way <10001f, per foot.

Placement – 2” RGS per foot.

Placement – 4” RGS per foot.

Placement – 2” fiberglass, bridge mount, per foot.

Placement – 4” fiberglass, bridge mount, per foot.

Detectable Tracer Wire, per foot.
Furnish and install a 14 GA tracer wire for placement in conduit.

Detection – Detectable Marking Tape, per foot.

Detection – jet line, per foot.

ROW detection – ROW delineator marker post, orange, 6’, per each.

Cable Route Markers

Furnish and install delineators that are tubular and designed and constructed of Type III HDPE material. Provide delineator assemblies that are ultraviolet stabilized, to help prevent their components from color fading, warping, absorbing water, and deteriorating with prolonged exposure to the elements. Provide delineator posts that have a cap that is orange in color.

The delineator assemblies shall include the descriptive information "IRC–IS&T FIBER OPTIC CABLING, CALL BEFORE DIGGING, 772–226–4357” printed black on orange reflective background material that will not fade or deteriorate over time. The printed message shall be partially visible from all directions approaching the assembly.

7.5 FIBER OPTIC CABLING AND RELATED ITEMS

7.5.1 General Requirements

Furnish, install, splice, and test all fiber optic cable, fiber optic assemblies, patch cords, and all passive network infrastructures including, but is not limited to, splice trays and closures, patch panels, fan-outs, terminations, and fusion splices.

Furnish all tools, equipment, materials, supplies, and manufactured articles, and perform all operations and equipment integration necessary to provide a complete, fully operational passive fiber optic infrastructure.

The necessary equipment shall be the responsibility of the Contractor. Provide all labor and equipment necessary to move inventory and to transport it to the installation location. Install all items in accordance with the manufacturer's instructions or as directed by the Owner.

7.5.2 Fiber Optic Cable Specifications

The following table presents the optical requirements of the single mode and multimode fiber:

Parameters	Single Mode	Multi
Type	**Step Index**	**Graded Index**
Core Diameter	8.3 µm (Nominal)	50 µm
Cladding Diameter	125 µm	125 µm
Core to Cladding Offset	≤0.8 µm	≤1.5 µm
Coating Diameter (OSP)	245 µm	245 µm +/-5 µm
Coating Diameter (IP)	900 µm ±15 µm	
Cladding – circularity	≤ 0.7%	
Proof Tensile Test	100 kpsi (0.7 GN/m^2)	
Attenuation		
@850 nm (MM)	N/A	≤ 3.5 dB/km
@1300 nm (MM)	N/A	≤ 1.0 dB/km
@1310 nm (SM)	≤ 0.4 dB/km	N/A
@1550 nm (SM)	≤ 0.3 dB/km	N/A
Bandwidth		
@850 nm (MM)	N/A	200
@1300 nm (MM)	N/A	1000
Chromatic Dispersion		
Zero Dispersion	1301.5/1321.5 nm	
Wavelength Zero		
Dispersion Slope	0.089 ps/nm^2 - km	
Maximum Dispersion	3.3 ps/(nm*km) for 1285–1330 nm <18ps/(nm*km) for 1550 nm	
Cut – Off Wavelength	1260 nm	
Numerical Aperture		
(EIA – 455 – 47)	NA	0.275

All optical fibers shall be proof tested by the fiber manufacturer at a minimum load of 100 kpsi. All optical fibers shall be 100% attenuation tested at the factory for compliance with performance specifications described herein. The attenuation data for each fiber shall be provided with each cable reel.

7.5.3 Fiber Optic Cable Outside Plant (OSP)

Provide outside plant cable (OSP) suitable for installation in an underground conduit environment including constant immersion in water for outdoor installations. The cable shall be provided and installed in continuous links. Fibers in the fiber optic cable shall be spliced and/or terminated as specified by the Owner project supervisor.

All optical glass shall be of the same manufacturer.

The cable shall be capable of withstanding a minimum–bending radius of ten (10) times its outer diameter during operation and twenty (20) times its outer diameter during installation, without changing the characteristics of the optical fibers.

All fibers are to be single mode unless specifically noted on plans by the Owner.

Unless specified otherwise, provide cable of water-blocked, loose tube construction with buffer tubes wrapped around a dielectric central strength member. All fiber(s) shall be contained within buffer tubes, and each buffer tube shall have an inside diameter much greater than the total diameter(s) of the fiber(s) it supports. The fiber optic cable shall have a reverse oscillation or planetary stranding structure.

The buffer tubes and all fibers shall be color coded in compliance with EIA/TIA – 598 "Color Coding of Fiber Optic Cables".

Jacket construction and configuration of the groups shall be such that they can easily be separated at splice points, permitting one set of fibers to be cut and spliced while the others remain continuous.

The jacket or sheath shall be marked with the manufacturer's name, date of manufacture, cable description, and sequential measurement markings at least every 3'. IRC-IS&T shall be marked on the jacket/sheath for agency identification.

Submit proposed cable designs for Owner approval prior to procurement and installation of cable plant if the cable is something other than what is normally used.

The cable shall have a water-block tape over the buffer tubes and throughout the remainder of the cable, to prevent entry of water.

Each fiber or group of fibers, shall be free-floating within the tubes such that all mechanically or environmentally induced stress placed upon the cable is decoupled from the fibers. The air within the buffer tubes shall be displaced with a gel to prevent entry by water and to facilitate free movement of the fiber(s) within.

The cable shall be capable of withstanding a pull tension of 2700 N (600 pounds) under load condition and 600 N (135 pounds) under static conditions and a crush resistance of 220 N/cm (length of cable), without changing the characteristics of the optical fibers. The outer jacket shall be UV and fungus resistant.

7.5.4 Cables Labeling

Cables shall be distinguishable from each other by labeling. Cable tags similar to Blackbox 32785 shall be attached to the cable at each pull box, pole attachment, or entry into a termination facility. The tag shall be marked as "IRC-IS&T, FIBER OPTICS, 772-226-4357". These tags will be provided by IS&T.

7.5.5 Riser Cables up to 24 Fibers (Multimode OFNP)

In cables with more than one (1) fiber, the fibers shall be stranded around a dielectric central member and surrounded by layered aramid yarns. The aramid yarns shall serve as the tensile strength member of the cable. A ripcord may be applied between the aramid yarns and the outer jacket to facilitate jacket removal. The outer jacket shall be extruded over the aramid yarns for physical and environmental protection.

7.5.6 Riser Cables with more than 24 Fibers (Multimode OFNP)

The buffered fibers shall be grouped in twelve (12) fiber subunits. In each subunit, the individual fibers shall be stranded around a dielectric central member and surrounded by layered aramid yarns. A ripcord shall be incorporated in the subunit design to facilitate access to the individual fibers. The subunit jacket shall be extruded over the aramid yarns for additional physical and environmental protection. The subunits shall be stranded around a dielectric central member. A ripcord shall be inserted beneath the outer jacket to facilitate jacket removal. The outer jacket shall be extruded around the units for physical and environmental protection.

7.5.7 Non-Plenum Applications

The storage temperature range for the cable on the original shipping reel shall be -400°C to +700°C. The installation/operating temperature range for riser cables shall be -200°C to +700°C. Testing shall be in accordance with FOTP-3.

7.5.8 Plenum Cables up to 24 Fibers (Multimode OFNP)

The fibers may be stranded around a dielectric central member and surrounded by layered aramid yarns. The aramid yarns shall serve as the tensile strength member of the cable. A ripcord shall be applied between the aramid yarns and the outer jacket to facilitate jacket removal. The outer jacket shall be extruded over the aramid yarns for physical and environmental protection.

7.5.9 Plenum Applications

The storage temperature range for the cable on the original shipping reel shall be -400°C to +700°C. The installation/operating temperature range for plenum cables shall be -200°C to +700°C. Testing shall be in accordance with FOTP-3.

7.5.10 List of Items for Fiber Optics Cabling

The items and services listed below are not an all-inclusive list. Furnish, install, splice, and test all fiber optic cable, fiber optic assemblies, patch cords, and all passive network infrastructures including, but not limited to, splice trays and closures, patch panels, fan–outs, terminations, and fusion splices. The fiber-optic cables listed below shall conform to the specifications in section 7.5.2.

a) 12 fiber, SM, loose – tube construction (aerial placement or underground placement)
b) 24 fiber, SM, loose – tube construction (aerial placement or underground placement)
c) 48 fiber, SM, loose – tube construction (aerial placement or underground placement)
d) 72 fiber, SM, loose – tube construction (aerial placement or underground placement)
e) 96 fiber, SM, loose – tube construction (aerial placement or underground placement)
f) 144 fiber, SM, loose – tube construction (aerial placement or underground placement)
g) 24 fiber, SM, all dielectric self-supporting construction (aerial placement)
h) 48 fiber, SM, all dielectric self-supporting construction (aerial placement)
i) 96 fiber, SM, all dielectric self-supporting construction (aerial placement)
j) 144 fiber, SM, all dielectric self-supporting construction (aerial placement)
k) 24 fiber, SM, riser rated construction
l) 48 fiber, SM, riser rated construction
m) 96 fiber, SM, riser rated construction
n) 12 fiber, SM, plenum construction
o) 24 fiber, SM, plenum construction
p) 48 fiber, SM, plenum construction
q) 96 fiber, SM, plenum construction
r) 12 fiber, MM, plenum rated, tight buffer
s) 24 fiber, MM, plenum rated, tight buffer
t) 12 fiber, MM, plenum rated construction
u) 24 fiber, MM, plenum rated construction

7.6 Cable Pulling

Before starting any construction, all of the Contractor's personnel (including subcontractors) shall be thoroughly familiar with and shall comply with Occupational Safety and Hazard Act (OSHA) regulations, FDOT safety practices and policies, and the Florida State "One-Call" System requirements.

Perform the cable pulling operation in such a manner that the minimum-bending radius of the cable shall not be exceeded in the unreeling and pulling operations. Use entry guide chutes to guide the cable into the pull-box conduit ports. Utilize lubricating compound to minimize cable-to-conduit friction. Lubricating compound shall be a water-based compound specifically produced for fiber optic cable lubrication. Lubricants such as dish soap and other substitutes are not allowed.

Corner rollers (wheels), if used, shall not have radii less than the minimum installation bend radius of the cable. A series array of smaller wheels can be used for accomplishing the bend, if the cable manufacturer specifically approves the array. Continuously measure the cable pulling tension; the pulling process shall not be allowed to exceed the maximum tension specified by the manufacturer of the cable. Fuse links and breaks shall be used to insure during the pulling process the cable will not be subjected to pulling stresses exceeding exceed 2700 N (600 lbs.).

When simultaneously pulling fiber optic cable with other cables, separate grooved rollers shall be used for each cable.

The Contractor is permitted to use air-assisted blowing for the fiber optic cable installation within the conduit. Air-assisted blowing may consist of either the high air speed blowing (HASB) method or the piston method.

While using the HASB method, the volume of air passing through the conduit shall not exceed 600 cfm or the air pressure stipulated by the conduit manufacturer. In using the piston method, the volume of air passing through the conduit shall not exceed 300 cfm or the conduit manufacturer's recommended air volume, whichever is more restrictive.

The Contractor shall insure that the fiber optic cable procured for this project, is flexible and approved by the cable manufacturer for air-assisted blowing installation methods. The Contractor shall also be responsible for ensuring that the type of conduit procured for this project, does not have physical characteristics that would disrupt the flow of air needed for proper cable installation (e.g. circumferential ribs or corrugations).

The conduit shall be able to hold up to 100 Psi of air without leaks. Conduit splices are critical and shall not reduce the interior diameter of the conduit. Aluminum couplers, suitable for air-assisted blowing of fiber optic cable, shall be used for both HASB and piston method cable installations.

A factory furnished lubrication, especially engineered for blowing methods of cable installation, shall be used, and regular cable-pulling lubricants shall not be permitted for air-assisted blowing installation methods.

Fiber optic simplex duct plugs used with air-assisted blowing installations, shall require seals sized to the cable in order to prevent leakage from the pressure chamber around the entering cable.

General field procedures for air-assisted blowing installations of fiber optic cable shall be as follows:

1. Ensure that the conduit system is properly installed with pressure-tight conduit splices. Test the conduit system prior to cable installation by sealing one end of the conduit and pressurizing the conduit using a sealed blowing machine. The conduit should not lose air pressure at any significant rate as determined by the Owner.
2. If using the HASB method, cap the front end of the cable to prevent it from hanging up in the conduit. Use air seals that fit properly around the outside diameter of the cable being installed.
3. Clean, dry, and establish the airtight integrity of the conduit, by blowing a hard mandrel through the conduit to establish that the conduit is not crushed. Blow a tight-fitting foam carrier through the conduit at high pressure. The foam carrier should travel through at approximately 100 fps in a clean conduit. If excess water or dirt comes from the conduit, repeat the process. At the Owner's discretion, dry the conduit with dry airflow prior to cable installation.

4. For the HASB method, inject the recommended amount of lubricant, and spread it by blowing another foam carrier through. For the piston method, inject the majority of the lubricant in front of the missile with some lubricant placed behind it.

5. Connect the blowing machine to the conduit. For HASB machines, hand feed approximately 100' of cable into the duct prior to closing and sealing the cable and air chamber on the blowing machine. For piston machines, attach the piston to the cable and insert the piston into the duct. For both installation methods, follow the machine manufacturer's instructions for all operations.

6. Check all pneumatic and hydraulic hook-ups prior to increasing the air pressure.

7. Keep cable ends sealed at all times during installation, using an approved cable endcap. Do not use tape to seal the cable end. The cable end shall remain sealed until termination takes place.

8. Install fiber optic cable such that the optical characteristics are not degraded in any manner. Provide adequately trained personnel for the installation of the cable and for the fusion splicing. Test all fiber links.

9. Provide sufficient slack for proper termination in the cabinet communications compartment for all cables that are not immediately terminated.

Throughout the cable plant, pull and store excess cable slack at each pull box, splice box, hub, and each TMC or TOC. The following lengths of slack cable are minimums:

a) Small fiber pull box 50 ft.
b) Large fiber pull box 200 ft.
c) Fiber splice box 200 ft.
d) Bridge barrier wall 20 ft.
e) Device cabinet 20 ft.
- Hub Building (Inside) 100 ft.
- TMC (OSP Entrance)100 ft. Maximum

f) Equipment/Control Room 50 ft. Slack at FO Distribution Panel

-OR- AS SPECIFIED BY THE COUNTY PROJECT SUPERVISOR

Provide proper storage of slack cable – both long term and short term. Do not leave slack cable lying free on the ground, bottom of a pull box, or floor of a device cabinet, hub building, or RTMC, except during the actual pulling process.

7.7 Optical Splicing and Termination Requirements

Utilize the fusion technique for all splices. Utilize fusion splicing equipment that has been cleaned, calibrated and specifically adjusted to the fiber and environmental conditions. Provide splice enclosures, organizers and incidentals, and cable and preparation tools and procedures, compatible with the cable type being delivered. Maximum allowable splice loss is .04db.

Each spliced fibers shall be packaged in a heat shrinkable splice protection sleeve with strength member. The protection sleeve shall cover the splice and have any bare fiber stripped of its coding.

The use of RTV or silicon is strictly prohibited.

7.7.1 Splice enclosures

Provide and install outdoor optical splice enclosures (3M 2178 or equivalent) capable of aerial, duct, or buried applications. The splice enclosure shall provide space enabling entry of fiber optic cable without exceeding the minimum bend radius of the cable. The splice enclosure shall be capable of through, branch, or mid-span type splice locations. Only one (1) cable per entry port

shall be allowed. Furnish and install the splice closure with the correct number of entry ports as dictated by each fiber optic splice location.

The splice enclosure shall be designed to permit selective fiber splicing (looping of backbone cable in and out while only cutting the desired fibers). The splice enclosure shall allow splicing of all fibers in the cables being terminated. The enclosure shall be waterproof and re-enterable, and shall be designed to protect the buffer tubes in the splice trays.

The splice trays within the enclosure shall be capable of accommodating the required number of splices including storage and protection of slack fiber.

All pricing for fiber count splices as listed in Section 7.7.8, are to be inclusive of all necessary labor and materials needed to complete the job. This shall include, but is not limited to, labor, splice enclosures, trays, inserts, splice sleeves and all other hardware and consumables.

7.7.2 Interconnect centers

Furnish compact, modular interconnect centers (3M 8423 or equivalent) designed to mount (rack or wall) insight equipment cabinets. Design and size interconnect centers to accommodate all fibers entering equipment cabinets.

Provide splice trays that, protect, and organize optical fibers and that secure fibers inside the splice tray. Design and size splice trays that fit accordingly into a 19” rack or wall mount unit that accommodate all fibers entering the splice tray and that shall provide sufficient space to prevent micro-bending of optical fibers.

All terminated fiber shall be tested with an OTDR in the fashion described Section 7.2.5.

All fiber optic terminations of OSP fiber shall be done in the manner of fusion splicing on a factory polished pigtail. All pigtails, as well as port plates, shall utilize the ST standard unless otherwise called for. All pricing for the termination of the following counts of fiber shall to be inclusive of all labor and materials needed to complete the job. This shall include, but not limited to, labor, enclosure, port plates, splice trays, inserts, splice sleeves, and all other hardware and consumables.

7.7.3 Splice slack

A maintenance loop at each pull box or fiber optic splice box, shall be at least 50’ of cable (or as specified by the Owner Project Supervisor); this slack cable shall be coiled and neatly placed in the splice box. This shall allow for future splices in the event of a damaged splice. Additionally, every effort shall be made to maintain a minimum of 10’ of cable from each cable's entering the enclosure which shall be prepared and installed within the enclosure.

7.7.4 Splice loss

Individual splice loss shall not exceed .04 dB loss.

7.7.5 Installation slack

For all fiber runs, approximately 10% slack will be evenly distributed along the path for future emergency repairs or relocations. Aerial locations shall utilize “snow shoes” and underground shall utilize pull boxes.

7.7.6 Optical termination requirements

ST fiber optic connectors are standard for use on each project and shall be utilized by function in the following manner or as specified by the Owner Project Supervisor. Utilize ST type fiber optic connectors at the field device level. ST connectors shall be comprised of a ceramic ferrule, nickel plated zinc, or composite connector body to accommodate a field bayonet connection.

Utilize factory pre-terminated assemblies that adhere to the applicable cable, cordage and fiber specifications of this document. All inside plant (IP) assemblies shall meet NEC jacketing requirements and shall have outer jacket coloration of yellow for single mode. No splices of any type are allowed within an assembly. Each assembly shall be individually packaged within a plastic bag, and that bag shall have the submitted manufacturers part number marked clearly on the outside of said bag. Each assembly shall be labeled as directed by the Owner.

7.7.7 Patch Cords and Pigtails

Utilize factory pre-terminated assemblies that adhere to the applicable cable, cordage and fiber specifications stated within this Technical Special Provision. All pigtails shall have a 3mm outer jacket unless otherwise noted. All pigtails shall use the same glass manufacturer and core diameter as the fiber it is being fusion spliced to. All IP assemblies shall meet NEC jacketing requirements for this project's application and shall have outer jacket coloration of yellow and aqua for multi-mode. The connector shall accommodate the fiber type and size associated with this project.

No splices of any type are allowed within an assembly. Each assembly shall be individually packaged within a plastic bag, with the submitted manufacturer's part number marked clearly on the outside. Each assembly shall be labeled as directed by the Owner.

Optical Termination Losses:

Connector Type	Installation	Max. Loss	Return Loss
ST/SC/LC Single Mode	Field	0.30dB	>.40dB
ST/SC/LC Single Mode	Factory	0.25dB	>.45dB

7.7.8 List of Items for Optical Splicing and Termination

The items and services listed below are not an all-inclusive list. Furnish, install, splice, and test all fiber optic cable, fiber optic assemblies, patch cords, and all passive network infrastructures including, but not limited to, splice trays and closures, patch panels, fan–outs, terminations, and fusion splices. The fiber-optic cables listed below must conform to the specifications in Section 7.5.2.

a) 12 fiber, SM/MM, termination
b) 24 fiber, SM/MM, termination
c) 48 fiber, SM/MM, termination
d) 72 fiber, SM/MM, termination
e) 96 fiber, SM/MM, termination
f) 144 fiber SM/MM, termination
g) 12 fiber, SM/MM, splice
h) 24 fiber, SM/MM, splice
i) 48 fiber, SM/MM, splice
j) 72 fiber, SM, splice
k) 96 fiber, SM, splice
l) 144 fiber, SM, splice
m) 06 fiber, SM, buffer fan-out kit
n) 12 fiber, SM, buffer fan-out kit
o) FO Connector – ST type, MM, Unicam connector
p) FO Connector – ST type, SM, Unicam connector
q) FO Closure – re-entry kit, cable preparation, up to 144 fiber, aerial or underground installation
r) FO Splice – OTDR test any wavelength, one direction, bare fiber
s) FO Closure – splice tray, fusion heat shrink, 12 fiber, 12" size
t) FO Closure – splice tray, fusion heat shrink, 24 fiber, 12" size
u) FO Splice – fusion splice, heat shrink <0.04 Db, OSP including detail as needed
v) OSP Aerial – messenger table, $^1/_4$", per foot
w) OSP Aerial – remove messenger cable, $^1/_4$", per foot

x) OSP Aerial – pole attachment, loose tube, with J-hook concrete pole
y) OSP Aerial – pole attachment, loose tube, with J-hook wood pole
z) OSP Aerial – place pole riser, 2”, RGS
aa) OSP Aerial – place pre-stressed concrete pole, 35’, utility
bb) OSP Aerial – place pre-stressed concrete pole, 45’, utility
cc) OSP Aerial – place pre-stressed concrete pole, 70’, utility
dd) OSP Aerial – place down guy anchor, 6’

7.8. PULL BOXES

7.8.1 General Requirements

Furnish and install polymer concrete/fiberglass reinforced polymer pull boxes for fiber optic splicing, storing fiber optic cable, cable pull boxes, and noninvasive magnetic detection system appliances. Pull boxes shall be lightweight, high strength, resistance to sunlight, resistant to petrochemicals, unaffected by freeze/thaw cycles, straight sided, flush fit with sidewalk or grass, no grounding required, and be capable of anchor inserts to allow for mounting rail attachment. All fiber optic pull boxes shall be of one piece box construction. Approved fiber optic pull boxes for use in a fiber optic environment are as follows:

Fiber optic pull boxes shall be manufactured of a composite mixture of polymer and concrete, and reinforced by a heavy-weave fiberglass, creating a material compressive strength of no less than 110 Psi. Each fiber optic pull box shall have a minimum design rating of 20,800 pounds, over a 10” x 10” area and be designed and tested to temperatures of -50° F.

Supply fiber optic pull boxes with a heavy-duty cover having a minimum elastic design load of 20,800 pounds over a 10” x 10” area. All covers shall be produced to the AASHTO H-20 Cover Rating and meet a ASTM C857 load test of 20,800 pounds, performed as stated in AASHTO T280-87, “Standard Method of Testing For Concrete Pipe, Section, Or Tile”, Section 5, and as referenced in ASTM C497. Supply a minimum of two (2) hex head bolts with washers to secure the cover to the fiber optic pull box. Any cover that has a length of above 39”, shall be split or divided into two (2) equal lengths. Fiber optic pull box covers shall be embossed with “Fiber Optics” on the outside of the cover. fiber optic pull box covers shall have J-hook slots (1”W x 4”L). All pull box lids shall be embossed with “FIBER OPTICS”.

7.8.2 Fiber Optic Pull Box Installation Process

Prepare the excavation a minimum 6”-12” deeper than the depth of the fiber optic pull box. Add a minimum 6” of crushed rock for drainage as required, to bring the top of the box to finished grade level.

Place fiber optic pull box in hole with top at grade level.

While fiber optic pull box cover is in place, fill and compact soil to grade level. If grade level is raised later, the fiber optic pull box can be pulled up and bricked at the bottom with one (1) brick per side [a total of four (4)]. The cavity produced by this raising shall be eliminated by the addition of crushed rock.

7.8.3 Fiber Optic Pull Box Installation Conduit Entry

Install 22.5º to 45 º conduit sweeps into the fiber optic pull box. Conduit ends shall align in the pull box so the fiber optic cable is subjected to no more than 75% of the maximum bending radius of the cable. Provide and install a reinforced concrete apron around the installed pull box.

7.8.4 Fiber Optic Splice Vault

The fiber optic splice vault shall be manhole type, concrete constructed, with a 1/4” x 36” diameter traffic steel cover (diamond plate) with intermediate beam supports. It shall have the dimensions of 48”H x 48”W x 48”D, and shall be an open bottom manhole with a concrete collar placed at grade 12” around the entire perimeter of vault 4” thick with reinforced steel mesh.

7.8.5 List of Items for Fiber Optic Pull Boxes

The items and services listed below are not an all-inclusive list. Furnish and install the following items as required:

a) Pull Box – concrete, 4'H x 4'W x 4'D, with steel lid
b) Pull Box – composite construction, 24"H x 36"W x 24"D, with composite lid
c) Pull Box – composite construction, 24"H x 36"W x 24"D, traffic rated with composite lid
d) Pull Box – composite construction, 17"H x 30"W x 12"D, with composite lid
e) Pull Box – composite construction, 17"H x 30"W x 12"D, traffic rated with composite lid

7.9 OUTSIDE PLANT CABINETS

7.9.1 General Requirements

Install only Field Device Cabinets Type II (336S Special), Type III (332 Special), and Type VI (Hub Cabinet). This shall encompass all labor, equipment, materials required for pickup site delivery, validation, power hookup, and all required appurtenances for complete and operational cabinet. Cabinets shall provide an environmentally secure enclosure to house (ITS) Intelligent Traffic Systems field equipment, subsystems and systems, lighting and surge protection. The cabinet shall be designed for the explicit use of housing and protecting sensitive electronic equipment (Encoders, 10/100/1000 Ethernet switches, media converters, port/terminal service, fiber optics equipment, and other related components, etc.) within a controlled environment necessary for the proper operation of installed electronic equipment. The unit price for an installed detector cabinet shall consist of the furnishing and installation of a foundation, slab, electrical service and the transport and placement of the detector cabinet on said foundation and/or slab. The installed detector cabinet shall also include any ancillary equipment or incidental items, including mounting hardware, cabinet base, foundation, bridge pedestal base plate, and restoration of the surrounding ground to its original condition.

7.9.2 Field Device Cabinet Type II (336S Special)

Install field device cabinet that provides an environmentally secure enclosure to house ITS field device equipment, subsystems and systems, lighting and surge protection. The cabinet shall be designed for the explicit use of housing and protecting sensitive electronic equipment (Encoders, 10/100/1000 Ethernet switches, media converters, port/terminal servers, fiber optics equipment, and other related components, etc.) within a controlled environment necessary for the proper operation of installed electronic equipment.

The detector cabinet shall meet or exceed the following minimum requirements:

a) Size: Outside dimensions shall be approximately 46”H x 24”W x 24”D;
b) Lighting: The cabinet shall include door activated 20W cool white fluorescent lights;
c) Electrical Outlets: One duplex (GFI) receptacle shall be included with every cabinet;
d) Equipment Racks: One 19” equipment rack, adjustable 4-post design with 5/8” - 5/8” – 1/2“ spacing, with holes tapped for #12-24 screws. A rack-mounted drawer shall be included with the rack;
e) Air Filtration: The cabinet shall contain a filtered air intake vent featuring re-usable, washable type filters;
f) Power Distribution: The 30A main breaker provided in the cabinet shall distribute power to rack mounted equipment, lighting and outlets;
g) Surge Protection:

1. Primary surge suppression shall consist of a wall or flush mounted unit with 12 AWG terminals with a maximum 80kA (8/20ºs), protecting lines L-N, L-G, L-L, and N-G. The unit shall meet the following environmental requirements: ambient temperatures of -40ºF to 185ºF (-40ºC to 85ºC working) and 95% RH (non-condensing). Dimensions shall be 4.5" x 2.9" x 2.3".
2. A nine-outlet (seven switched, two un-switched) rack mounted surge suppressor unit shall be installed. The maximum surge current shall be 84kA with a load current of 15A or 20A, at a working voltage of 120V 50/60Hz.
3. A 19" DIN Rail kit assembly shall be installed and have enough space for 32 modular surge suppressor devices (RJ11, RJ45, or BNC connector type) attached, meeting the following criteria: ambient temperature of -40ºF to 185ºF (-20ºC to 85ºC working) and 95% RH (non-condensing). Dimensions shall be 5.04"H x .99"W x 2.25"D.

h) Common Grounding System: A floor mounted 12-position ground bar shall be provided with the cabinet.

i) Cabinet Construction:
1. The cabinet shall contain R-4 insulation to control the effect of environmental conditions.
2. Cabinet shall be of 1/8", 5052 Aluminum construction with white powder coat finish to eliminate rusting.
3. Doors shall have NEMA 3R rated with neoprene gasketing, for maximum equipment protection, and shall have heavy-duty 3-point hardware on all doors.
4. All hinges shall be 1/8" aluminum with a stainless steel piano hinge, or continuous door length stainless steel hinges.

7.9.3 Field Device Cabinet Type III (332 Special)

Install field device cabinet that provides an environmentally secure enclosure to house ITS field device equipment, subsystems and systems, lighting and surge protection. The cabinet shall be designed for the explicit use of housing and protecting sensitive electronic equipment (Encoders, 10/100/1000 Ethernet switches, media converters, port/terminal servers, fiber optics equipment, and other related components, etc.) within a controlled environment necessary for the proper operation of installed electronic equipment.

The detector cabinet shall meet or exceed the following minimum requirements:

a) Size: Outside dimensions shall be approximately 66"H x 24"W x 30"D;

b) Lighting: The cabinet shall include door activated 20W cool white fluorescent lights;

c) Electrical Outlets: One duplex (GFI) receptacle shall be included with every cabinet;

d) Equipment Racks: One 19" equipment rack, adjustable 4-post design, with 5/8" - 5/8" – 1/2" spacing with holes tapped for #12-24 screws, a rack-mounted drawer shall be included with the rack;

e) Air Filtration: The cabinet shall contain a filtered air intake vent featuring re-usable, washable type filters;

f) Power Distribution: The 30A main breaker provided in the cabinet shall distribute power to rack mounted equipment, lighting, and outlets;

g) Surge Protection:
1. Primary surge suppression shall consist of a wall or flush mounted unit with 12 AWG terminals with a maximum 80kA (8/20ºs), protecting lines L-N, L-G, L-L, and N-G. The unit shall meet the following environmental requirements: ambient temperatures of -40ºF to 185ºF (-40ºC to 85ºC working) and 95% RH (non-condensing). Dimensions shall be 4.5"H x 2.9"W x 2.3"D.

2. A nine-outlet (seven switched, two un-switched) rack mounted surge suppressor unit shall be installed. The maximum surge current shall be 84kA with a load current of 15A or 20A, at a working voltage of 120V 50/60Hz.
3. A 19" DIN Rail kit assembly shall be installed and have enough space for 32 modular surge suppressor devices (RJ11, RJ45, or BNC connector type) attached, meeting the following criteria: ambient temperature of -40ºF to 185ºF (-20ºC to 85ºC working) and 95% RH (non-condensing). Dimensions shall be 5.04"H x .99"W x 2.25"D.

h) Common Grounding System: A floor mounted, 12-position ground bar, is to be provided with the cabinet;

i) Cabinet Construction:
1. The cabinet shall contain R-4 insulation to control the effect of environmental conditions.
2. Cabinet shall be of 1/8", 5052 Aluminum construction with white powder coat finish to eliminate rusting.
3. Doors shall have NEMA 3R rated with neoprene gasketing for maximum equipment protection and shall have heavy-duty 3-point hardware on all doors.
4. All hinges shall be 1/8" aluminum with a stainless steel piano hinge, or continuous door length stainless steel hinges.

7.9.4 Hub Cabinet Type IV (Model 336S Special)

Install cabinet that provides an environmentally secure enclosure to house ITS field device equipment, subsystems and systems, lighting and surge protection. The cabinet shall be designed for the explicit use of housing and protecting sensitive electronic equipment (Encoders, 10/100/1000 Ethernet switches, media converters, port/terminal servers, fiber optics equipment, and other related components, etc.) within a controlled environment necessary for the proper operation of installed electronic equipment.

The cabinet shall meet or exceed the following minimum requirements:

a) Size: Outside dimensions shall be approximately 48"H x 24"W x 24"D;

b) Cabinet Configuration: The cabinet is a single door cabinet with one (1) NEMA 4 rated internal cabinet mounted to the interior of the outer cabinet;

c) Lighting: The cabinet shall include door activated 20W cool white fluorescent lights;

d) Electrical Outlets: One (1) duplex (GFI) receptacle shall be included with every cabinet;

e) Equipment Racks: One (1) 19" equipment rack, adjustable 4-post design, with 5/8" - 5/8" – 1/2" spacing with holes tapped for #12-24 screws, a rack-mounted drawer with tabletop shall be included with the rack. Cable management guides shall be included with the rack and shall be constructed of an 18-guage steel base plate with hook and loop fasteners. Four (4), two (2) front, two (2) rear 19" horizontal cable management guides and four (4), two (2) front, two (2) rear vertical cable management guides that shall run the vertical length of the rack;

f) Air Handling / Filtration: The cabinet shall contain two (2) thermostatically controlled fans, 100 cfm rated. The cabinet shall contain a filtered air intake vent featuring re-usable, washable type filters;

g) Power Distribution: The cabinet shall contain one 480/120 Volt transformer (Dry Type, 10KVA). A 30A main breaker shall be provided in the cabinet and shall distribute power to equipment, lighting, and outlets. The transformer and main breaker shall be mounted inside the outer cabinet;

h) UPS: The cabinet shall contain one managed uninterruptible power supply. The UPS shall be 19" rack mounted. The UPS shall be 120V input/120V output. Output power capacity shall be 1400VA/1050Watts. The unit shall have a serial interface port for management. The unit shall be no more than 3U high;

i) Surge Protection: Primary surge suppression shall consist of a wall or flush mounted unit with 12 AWG terminals with a maximum 80kA (8/20ºs), protecting lines L-N, L-G, L-L, and N-G. The unit shall meet the following environmental requirements;

1. Ambient temperatures of -40ºF to 185ºF (-40ºC to 85ºC working) and 95% RH (non-condensing). Dimensions shall be 4.5”H x 2.9”W x 2.3”D;
2. A nine-outlet (seven switched, two un-switched) rack mounted surge suppressor unit shall be installed. The maximum surge current shall be 84kA with a load current of 15A or 20A at a working voltage of 120V 50/60Hz;
3. A 19” DIN rail kit assembly shall be installed and have enough space for 32 modular surge suppressor devices (RJ11, RJ45, or BNC connector type) attached, meeting the following criteria: ambient temperature of -40ºF to 185ºF (-20ºC to 85ºC working) and 95% RH (non-condensing). Dimensions shall be 5.04”H x .99”W x 2.25”D

j) Common Grounding System: A floor mounted 12-position ground bar is to be provided with the cabinet.

7.9.5 Outer Cabinet Construction

The cabinet shall contain R-4 insulation to control the effect of environmental conditions. Cabinet shall be of 1/8”, 5052 Aluminum construction with white powder coat finish to eliminate rusting. Outer door shall have NEMA 3R rated with neoprene gasketing for maximum equipment protection and shall have heavy-duty 3-point hardware. All hinges shall be 1/8” aluminum with a stainless steel piano hinge, or continuous door length stainless steel hinges.

7.9.6 Inner Cabinet (NEMA 4) Construction

The cabinet shall be a NEMA 4 rated cabinet with approximate dimensions of 20”W x 24”H x 12”D. The cabinet shall be constructed of 16-guage stainless steel or other non-corrosive material. The cabinet shall contain one 12-guage mounting plate with 10”-32” x 2” treaded hole pattern mounted to the rear of the cabinet. The cabinet shall contain one heat sink mounted to the outside rear of the inner cabinet tangent to the mounting plate.

7.9.7 Device Cabinet Base

Install device cabinet base that provides an environmentally secure enclosure to house fiber optic splice closure, fiber optic drop cable slack, data cable slack, and power cable slack. The base shall be specifically fabricated to accommodate the detector cabinet as specified within this Section A268. Neoprene gasketing shall be supplied by the device cabinet base vendor that shall be applied by the installation contractor between the base and the detector cabinet. The device cabinet base shall meet or exceed the following minimum requirements:

a) Outside dimensions shall be approximately 16”H x 40”W x 24”D or 16”H x 24”W x 24”D;
b) Shall be fabricated from 1/8” aluminum;
c) Shall have an epoxy powder coating;
d) Shall have a front access panel with captive stainless steel screws;
e) Shall have an open top and open bottom, each with a 2” lip for mounting and/or attachment of the detector cabinet;
f) Shall have a conduit mounting plate of same size (width and depth), made of 1/4” stainless steel 316.
g) All screws and hardware shall be stainless steel. 7.9.8 Base Plate

All bridge pedestals shall have the existing open cable raceways sealed. These raceways shall be sealed by way of 1/4” stainless steel plates, anchored over the raceway by way of epoxy anchor drilled into the pedestal at a minimum depth of 11/4”. There shall be two sizes of base plates, 18” x 12” and 10” x 10”. The Contractor shall install the engineer’s system manager supplied base plates where noted and/or depicted within the plan set.

7.9.9 Hub Cabinet Type VI (Master Hub Cabinet)

Install a master hub cabinet that provides an environmentally cooled enclosure facility required for the sensitive network equipment to be furnished on this project. The cabinet shall be designed for the explicit use of housing sensitive electronic equipment (e.g., gigabit ethernet switches, 10/100 ethernet switches, media converters, port/terminal servers, fiber optics equipment, and other related components, etc.) within a controlled atmosphere required for the proper operating conditions for installed equipment and shall be furnished by the system manager.

The master hub cabinet shall meet or exceed the following minimum requirements:

a) Size: Dimensions shall be approximately 104”H x 108”W x 77”D;

b) AC Unit/Cooling Unit: The cabinet shall have an AC unit/cooling unit(s) with a minimum total cooling capacity of 20,000 BTUs. The AC unit/cooling unit(s) shall be designed specifically for outdoor electronic enclosures and shall be designed for a fully-gasketed, leak-proof installation in accordance with the NEMA 4/4X enclosure rating. Refrigerant shall be CFC-free;

c) Lighting: The cabinet shall include a switch controlled fluorescent light fixture providing adequate work lighting throughout the cabinet;

d) Electrical Outlets: Two (2) separate duplex (GFCI) wall electrical outlets for test/maintenance equipment shall be provided. Two (2) separate standard duplex outlets shall be supplied for equipment power;

e) Equipment Racks: Two (2) 19” EIA equipment racks with two (2) vertical and four (4) horizontal cable management panels per rack, placed as specified within the plan set;

f) Ladder Racks: Ladder rack cable management system as depicted within the plan set shall be provided;

g) Power Distribution: The cabinet shall provide for power distribution to all installed equipment racks, lighting and the air conditioning unit shall be provided;

h) Lightning Protection System: Provide for lightning protection for the overall, integrated structure, including each metallic (copper) conductor penetrating the cabinet;

i) Common Grounding System: A cabinet grounding system shall be provided;

j) Cabinet Monitoring System: A cabinet monitoring system shall be provided to continuously monitor and report local conditions (temperature, humidity, smoke, and door alarm).

7.9.10 Construction

Construct a flat, level, concrete base, meeting the requirements for Class 1, non-stressed concrete and shall be accepted according to Section 347 of the FDOT Standard Specifications, and the latest supplements. The minimum final grade shall be set at nominal 8” above the surrounding grade to ensure that water drains away from the cabinet. Restore surrounding surfaces to their original condition.

7.9.11 Method of Measurement

The Detector Cabinet Type II, Detector Cabinet III, and Detector Cabinet VI shall be measured for payment at each site as installed. Detector Cabinet IV and its corresponding base (A268-4.1) shall be paid as each is installed. The Detector cabinet base installed shall be an appurtenance of the Type IV Detector Cabinet. The unit price for each master hub cabinet installed shall include all labor, equipment, foundations, mounting hardware, and miscellaneous material necessary for a complete and acceptable installation. The engineer’s system manager will supply the cabinet assemblies as specified in the contract.

7.9.12 List of Items for Outside Plant Cabinets

Communications Cabinet – 35"H x 24"W x 22"D, with concrete base
Communications Cabinet – 51.25"H x 20"W x 18"D, with concrete base

Communications Cabinet – 37"H x 20"W x 17"D, with concrete base
Device Cabinet Type 332 - 66"H x 24"W x 30”D, with concrete base

7.10 County Specification 852 – NexusWorx Fiber Documentation

7.10.1 Description: The requirements contained herein address the technical data entry of OSP and ISP fiber optic systems documentation records updates, into the Indian River County BOCC – NexusWorx Portal Fiber Optic Documentation Application. The data / information being entered into the IRC NexusWorx Portal application is U.S. Homeland Security sensitive information, and will not be shared or discussed with other organizations or persons without the written authorization of Indian River County BOCC and the County Attorney’s Office.

7.10.2 General Requirements: Furnish labor only in either hourly or lump sum units, as listed below to cover fiber optic systems documentation update work as requested by the Owner. This will include but not be limited to entering technical information / detailed data provided by the Owner such as fiber optic as-built diagrams, fiber optic splice plans, technical drawings, MS Visio application drawings, etc… into the NexusWorx application portal site for update of IRC NexusWorx fiber documentation system. This technical documentation work will include additions to the IRC / IRC Fiber Consortium fiber optic network grid, modifications / changes that were made in the field by IRC fiber contractors, changes that were made by IRC Telecommunications department personnel. The data entry tasks include corrections or updates to existing data fields.

Data entry will involve updates and additions required to document individual fiber optic strand connections contained within each fiber optic cable, in the IRC / IRC Fiber Consortium fiber optic network grid. General data entry component groups in the NexusWorx portal application include, but are not limited to: Fiber Optic Cable Route, Fiber Optic Conduit, Fiber Cable Cabinet Site, Fiber Cable Splice Site, Fiber Cable Pull-box Site, Fiber Connectivity, GPS Location Coordinates Data Entry, and Fiber Access Points.

The labor classifications listed below will be in-house staff to your firm. Sub-Contracting or Assignment of this IRC fiber bid group is not allowed, due to U.S. Homeland Security concerns. The description of work that might be performed by someone in the following labor categories is typical. The technical educational and experience level is suggested and not necessarily required.

7.10.3 Fiber Optic Data Entry Technician: The individual in this position will interact directly with the Owner, and no one else, on any issues or questions which may arise, without making assumptions on the data entry, or format being applied. Direction of all information / data to be entered into the NexusWorx Portal application will be taken from the Owner.

a) **Duties:** The duties of this individual include, but are not limited to the following:
   - ✓ Review plans and specifications with Owner prior to update of NexusWorx data entry related to an IRC / IRC Fiber Consortium fiber project
   - ✓ Accurate and timely information / data entry into the NexusWorx Portal application. The Owner will provide application login credentials to all NexusWorx Editor Access level personnel. NexusWorx Portal login passwords and/or application login credentials are assigned to a specific Fiber Optic Data Entry Technician only, and may not be shared or divulged to other unauthorized persons.
   - ✓ Report any /all information data entry problems to the Owner in a timely manner
   - ✓ Update the Owner with project status each day so scheduling can be adjusted based on progress
   - ✓ Must have a clear understanding of fiber optic networks and fiber network documentation systems, covering aerial, underground, and inside plant environments. Must be capable of reading and comprehending project plans & specifications, with the ability to apply this understanding to enter

the technical information / data, effectively and accurately into the NexusWorx Portal application

e) **Troubleshooting**: Must be able to determine why the NexusWorx portal system is not accepting information updates or generating data entry errors, and notify the Owner of a problem that cannot be quickly corrected by the technician.
f) **Knowledge, Abilities, and Skills:** Proficiency in applying best practices for industry standard OSP & ISP fiber optic documentation systems and understanding how fiber optic systems cabling and individual fiber optic strands are visually represented and inter-connected in the fiber optic documentation environment.
g) **Technical Education and Experience:** Two years of technical experience, or an equivalent combination of training and experience is preferred.
h) **Licenses and Certifications:** Possession of a valid Florida Commercial Driver's License, Class B. FBI / CJIS level 2 Certification is highly recommended. Successful completion of NexusWorx End User Training / Certification Course provided by Byers Engineering Inc. is a prerequisite for the Fiber Optic Data Entry Technician. A copy of the NexusWorx End User Training course completion certificate must be provided to the Owner before access to the IRC NexusWorx Portal will be provided. All costs associated with registration, travel, and successful completion of the NexusWorx End User Training / Certification course will be completely at the Contractor's expense. Below is a brief description on the NexusWorx End User Training course. Course costs will vary, depending on Byers Engineering Inc. Training Course specifications.

   Byers Engineering has provided the following pricing for **NexusWorx End User training:** $4,200 (3 day course) – This covers the cost for standard 3 day training course for NexusWorx Editor Level. If training needs to be broken up into non-sequential sessions, the first day cost is $1,750. Each additional sequential day is $1,200. The training course will be conducted either by remote access or on-site at a location provided by the customer with internet connection and space adequate to support the attending trainees all with their own laptops or Windows PC's with internet access. Training for NexusWorx Application Editors is limited to one plus the number of NexusWorx Application subscriptions purchased. A total class size is limited to no more than 7 trainees for any class.

7.10.4 Basis of Payment: Price and payment will be full compensation for all work specified in this section. Payment will be made under:

Item No. 852-3 Labor – Fiber Optic Data Entry Technician, (per Hour)

Exhibit 2 to the Agreement – Pricing